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As the results of the radial velocities[6] leave little doubt as to the fact that the apparent motions of the Cepheids are in the mean an effect of the solar motion, the uncertainty in apex determination from proper motions warns us not to place too much faith in a mean parallax derived from parallactic motions. It seems therefore the safest policy for the immediate future, to adopt the conclusion arrived at by Curtis[7] and Kapteyn and van Rhijn, viz., to suspend judgment on all the important deductions involving the knowledge of the parallax of clusters until our data are more reliable.

In so far as the distances of the Cepheids bear on the general problem of galactic dimensions, it may be noted here that another indication of the desirability of reducing Shapley's distances is given by the parallax for M11 as derived by Lindblad[8]. His adopted value of $M - m = -12$ for this cluster (derived from the magnitudes of the A- and K-giants) corresponds to $\pi = 0''.00040$ (instead of $0''.00025$ as published by him) thus making it almost three times as close as Shapley[9] ($0''.00014$).

This may be supplemented by my estimate for the parallax of M52 derived from photographic magnitudes of 400 stars, determined at the Royal Observatory, Greenwich. The mean magnitude of the ten brightest stars (omitting the very brightest, which is still two magnitudes brighter and may not belong to the cluster) is $11^m.3$. Assuming these to be A-stars with an absolute magnitude as high as $0^m.0$ (for the highly luminous B-giants are rare in open clusters) we obtain $M - m = -11.3$ and accordingly as a lower limit for the parallax $0''.00055$, whereas Shapley (l. c.) finds $0''.00016$ from estimates of diameter.

WILLEM J. LUYTEN.

1922, April 17.

STARS WHOSE RADIAL VELOCITIES VARY

In the progress of our spectrographic observations of the naked-eye stars, to determine their velocities of approach and recession, cases of variable velocity have been noted as in the table below. The highest and lowest observed velocities for each star whose recorded spectrum shows but a single series of lines are set down in the next to the last column. Two series of lines

[6]The distribution over the sky is unfavourable in both cases.
[7]*Bulletins National Research Council*, **2**, 203, 1921.
[8]*Astroph. Journ.*, **55**, 85, 1922.
[9]*Proc. Nat. Acad. of Sciences*, **5**, 344, 1919.

have been observed for a considerable number of the stars, as noted in the last column. The visual magnitudes and the spectral classes recorded in the fourth column are from *Annals Harvard College Observatory*, **50.** The classifications for several stars in the list are erroneous, in minor degree, but they have been allowed to stand, with an occasional comment in the last column.

The stars situated south of declination —25° have been observed exclusively at the Chile Station of the Lick Observatory, but a few with declination values between —15° and —25° have been observed at both Mount Hamilton and Santiago, Chile. The spectograms at each observatory have been obtained by a considerable number of observers, but the measurement and reduction of the Mount Hamilton plates have been conducted almost exclusively by Miss Hobe. The Mount Hamilton observations have been made with 3-prism dispersion, but in Chile three spectographs, equipped with one prism, two prisms and three prisms, respectively, have been employed.

Star	R. A. 1900.0	Dec.	Vis. mag. spm	Obs'd range km./sec.	Remarks
λ *Phoenicis* .	0h 26m.6	—49°22′	4.9 A2	—34 to +20	Chile, 1-pr.
τ *Piscium* . .	1 06 .2	+29 34	4.7 Kp	+28 to +33	
ι *Arietis* . . .	1 51 .9	+17 20	5.2 Kp	—12 to 0	G5
b *Andromedae*	2 06 .9	+43 45	5.1 Kp	—50 to —38	
6 *Persei* . . .	2 07 .0	+50 36	5.4 G5	+22 to +34	
H. R. 1105 . .	3 33 .5	+62 54	5.3 Mb	—31 to —15	
H. R. 1138 . .	3 38 .8	+70 34	5.4 A		Double lines
A *Persei* . . .	3 49 .2	+50 24	5.5 F		Double lines
53 *Tauri* . . .	4 13 .5	+20 55	5.4 B8	+ 3 to +25	A5
*31 *Camelopard.*	5 46 .0	+59 52	5.3 A		Double lines
64 *Orionis* . .	5 57 .6	+19 41	5.2 B8		Double lines
45 *Aurigae* . .	6 13 .7	+53 30	5.4 F	—28 to +31	F5
18 *Monocerotis*	6 42 .7	+ 2 31	4.7 K	+ 6 to +14	
63 *Geminor.* .	7 21 .8	+21 39	5.3 F5		Double lines
b *Geminor.* .	7 23 .6	+28 07	5.1 G5	+28 to +37	K
g *Geminor.* .	7 40 .3	+18 45	5.0 K	+77 to +89	
O *Puppis* . . .	7 54 .7	—45 18	5.2 Kp	+38 to +62	Chile, 2-pr.
A. G. C. 10986	8 10 .5	—46 41	5.3 B3	—18 to +61	Chile, 2-pr.
ξ *Cancri* . . .	9 03 .6	+22 27	5.2 K	—12 to — 4	G5
*c *Urs. Maj.* .	9 06 .4	+61 50	5.2 F	—50 to +18	F8
23 *Hydrae* . .	9 11 .7	— 5 56	5.4 K5	—11 to — 4	
A. G. C. 12994	9 26 .2	—71 10	5.5 K	— 7 to + 6	Chile, 2-pr.
1 *Sextantis* .	9 31 .9	+ 7 17	5.1 G	+11 to +22	K
10 *Leo. Min.* .	9 51 .6	+41 32	5.2 F	—23 to +11	
A. G. C. 15571	11 18 .4	—35 37	5.1 K5	— 9 to + 1	Chile, 2-pr.
λ *Crateris* . .	11 18 .4	—18 14	5.2 G	+ 6 to +20	F, Mt. H'mt'n
				+ 6 to +18	Chile, 2-pr.
o *Centauri* . .	11 27 .1	—58 53	5.0 F8p	—25 to —12	Chile, 2-pr.
D *Centauri* . .	12 08 .8	—45 10	5.3 K	0 to + 9	Chile, 2-pr.

H. R. 4668 . .	12	11	.5	+33	37	5.1 K	—46 to —34	
4 *Draconis* . .	12	25	.7	+69	45	5.2 Ma	—18 to —11	
6 *Draconis* . .	12	30	.5	+70	34	5.2 G5	+ 1 to +13	K
β Muscae . . .	12	40	.1	—67	34	3.3 B3	+ 2 to +68	Chile, 1-pr.
δ Muscae . . .	12	55	.4	—71	01	3.6 K2	+34 to +46	Chile, 3-pr.
36 *Librae* . . .	15	28	.5	—27	42	5.2 K	+10 to +19	Chile, 2-pr.
A. G. C. 22108	16	13	.2	—30	40	5.4 F	—23 to + 1	G2,Chile,2-pr
H. R. 6455 . .	17	16	.1	+25	37	5.3 A	—10 to + 2	
105 *Herculis* .	18	15	.1	+24	24	5.5 K	—30 to —18	
f *Aquilae* . . .	19	15	.2	— 5	36	5.1 G	—26 to —12	
φ Aquilae . .	19	51	.5	+11	09	5.3 A2	—66 to + 1	
22 *Vulpeculae*	20	11	.2	+23	12	5.4 K	—48 to + 4	G5
35 *Cygni* . . .	20	14	.8	+34	40	5.2 F5	—22 to — 6	
30 *Vulpeculae*	20	40	.6	+24	55	5.1 K	+26 to +33	
α Octantis . .	20	52	.6	—77	24	5.2 F5	+15 to +86	Chile, 2-pr.
c *Capricorni* .	21	39	.6	— 9	32	5.3 K	— 5 to 0	
H. R. 8383 . .	21	53	.8	+63	09	5.4 Ma	—12 to + 5	Bri't H lines
32 *Aquarii* . .	21	59	.7	— 1	24	5.2 A2	+11 to +25	F
μ₁ Gruis . . .	22	09	.6	—41	51	4.9 G	—12 to + 1	Chile, 2-pr.
94 *Aquarii* . .	23	13	.8	—14	00	5.3 K	+ 5 to +16	G5
3 *Ceti*	23	59	.4	—11	04	5.2 K	—45 to —34	M6

*Also discovered at the Victoria Observatory.

W. W. Campbell.

May 10, 1922.

Three Probable Spectroscopic Binaries

The absorption lines in the spectra of the following stars change in width, suggesting that the stars are spectroscopic binaries whose components in each case are essentially alike in spectral type and brightness. All of the spectrograms were secured at the Chile Station of the Lick Observatory.

Star	R. A. 1900	Dec.	Vis. mag. spectrum	Remarks
4 *Eridani*	2h52m.9	—24°16′	5.41 A5	2-pr. and1-pr.
t *Puppis*	6 54 .7	—33 59	5.07 B5	2-pr.
A. G. C. 9455	7 19 .2	—31 41	5.43 B	1-pr.

W. W. Campbell.

May 15, 1922.

Radial Velocities of Class N Stars

Our knowledge concerning the radial velocities of Class N stars is at present very limited, since the complex spectrum of these stars renders such determinations difficult and uncertain on account of the absorption lines being either blends or affected by close emission lines. Especially is this true when low dispersion is employed to which, owing to the feeble photographic light of N stars, we are generally restricted.

Spectrograms of twenty-five Class N stars have been